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MELANIIDÆ OF THE PANUCO RIVER SYSTEM, MEXICO.

BY H. A. PILSBRY and A. A. HINKLEY.

The Pachycheili of the Panuco River system are all, so far as known, special to that drainage.[1] These waters are remarkably rich in fine species, which though not so large as some from Central America, are more varied in shape and sculpture. In a few species the spire is so short that the shell has a globular or oval shape, like *Anculosa* or *Paludomus*; yet in the structure of the aperture and operculum these aberrant forms agree with more normal species of the same region. One species, *P. pleurotoma*, has a Pleurotomoid sinus in the outer lip, somewhat like that of *P. dalli* Pils., but situated farther up.

The whole group of the Panuco drainage differs from the southern forms of *Pachycheilus* in the weakness or absence of the regular and close microscopic spiral striation characteristic of the typical species.

The shells are generally abundant. Of most of the forms several hundred shells at least of each species have been examined. All were collected by Mr. Hinkley during the past winter. The descriptions are the joint work of both authors. The figures are natural size. Cotypes of the new forms are in the collections of the Academy of Natural Sciences of Philadelphia and of Mr. Hinkley.

Since many of the localities mentioned herein are not indicated on maps available in this country, we give here a sketch of the lower portion of the Panuco River System.[2]

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[1] It is possible that *P. pluristriatus* is an exception, but the record of that species from a West Mexican lake seems improbable.

[2] Localities where mollusca were collected during the winter of 1908 and 1909 are marked on the map with numerals. These numbered stations are as follows:

No. 1. LaBarra.
" 2. Tampico.
" 3. Cave from which the Choy River issues.
" 4. Taninul, flag station for Hot Spring.
" 5. Hot Spring.
" 6. Catamas Lake.
" 7. Pujal Lake.
" 8. El Abra.
" 9. Valles Station.
" 10. Valles.
" 11. Small falls of the Valles River.
" 12. Ranch of Mr. Willis.
" 13. Chaimi Creek.
" 14. Pujal, Pujal ferry and ford.
" 15. Ford or ferry of the Coy River.
" 16. Alligator Lake.
" 17. First rill in the mountains south of Valles.

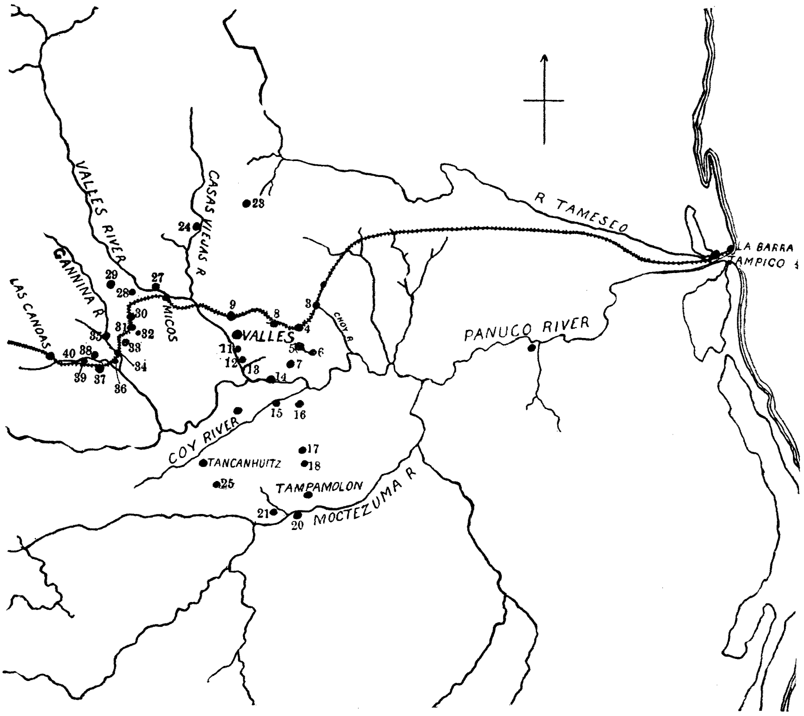

Fig. 1. Map of a portion of the Panuco River system, showing localities mentioned in this paper.

No. 18. Second rill in the mountains.
" 19. Tampamolon.
" 20. Ford and ferry of Moctezuma River.
" 21. Creek near the ford of Moctezuma River.
" 22. Tancanhutz.
" 23. Choy ranch.
" 24. Casas Viejas River.
" 25. Coxcantlan.
" 26. Mecos (Micos) and Mecos falls.
" 27. Rapids above Mecos.
" 28. Lagoon five miles west of Mecos.
" 29. Lagoon between mountains, no outlet.
" 30. Bluffs north of San Dieguito.
" 31. San Dieguito.
" 32. Cave.
" 33. Bluff southwest of San Dieguito.
" 34. Ganina River.
" 35. Tributary of Ganina River.
" 36. Rascon.
" 37. Tamosopo.
" 38. Mill of Tamosopo Sugar Co.
" 39. Natural Bridge and Verastagu.
" 40. Canyon.
" 41. Las Canoas.

According to the railroad map, the elevation of Valles is about 200 feet above the sea; El Abra, 700 feet; Mecos, over 1,000 feet; Tamosopo, 1,300 feet; Los Canoas, 3,300 feet.

Pachycheilus pila n. sp. Pl. XXIV, figs. 1–5.

The shell is solid and strong, irregularly *globose*, black, smooth but for inconspicuous growth-lines (except the very young shells which are delicately, closely striate spirally); *spire very short*, mainly eroded in adult shells, but concavely acuminate when preserved in the young. Only 2 or 3 whorls remain in adult shells, the last very globose throughout, more or less flattened below the suture near the aperture. The aperture is large, black within; outer lip thin, much more arcuate than the inner lip, which is only slightly arcuate. Columellar margin heavily calloused throughout, black, with a white lining on the inner border.

Length 19, diam. 16½ mm., longest axis of aperture 13 mm.
" 20, " 15½ " " " " 13 "
" 19, " 17 " aperture 13½ x 12¼ mm.
" 20, " 17 " " 13 x 10 mm.

Tamosopo River above and below the "Natural Bridge," near Verastagu, State of San Luis Potosi, Mexico.

The water in the basin above the bridge is in constant agitation, caused by the falls of several small streams feeding it and the narrow outlet, so there are several inches of the rock walls alternately covered and exposed. The positions occupied by the different species of *Pachycheilus* were quite diverse, the *P. pila* always being submerged, while *P. atratus* and *humerosus* were higher up and often entirely beyond the reach of the water. Below the bridge *P. pila* was on submerged rocks, while the other species were most plentiful at or near the surface.

This is the shortest, most globose species of *Pachycheilus* known, having the contour of an *Anculosa* or *Paludomus*. The youngest stage examined is about 2 mm. long, at which time the shape is ovate-conic. At 5½ mm. long, with the spire of 5 whorls still perfect, the last whorl has become inflated, and traces of very fine delicate spiral striæ remain. The types (pl. XXIV, figs. 1 to 5) are from below the "Natural Bridge." Some examples apparently adult are smaller than the dimensions given above, alt. 13½, diam. 13 mm.

Specimens from a tributary of the Tamosopo River at the Tamosopo Sugar Company's plantation are all smaller. Specimens measure:

Length 14, diam. 12, length of aperture 9 mm.
" 12, " 11, " " 8.8 "

Examples from a rill on the mountain side above the banana plantation at the "Natural Bridge" are very small, adults measuring 8 to 11 mm. long. This small race might be distinguished as *P. pila pilula* n. var. (pl. XXIV, fig. 6).

Pachycheilus tristis n. sp. Pl. XXIV, figs. 7–10.

The shell is *short, ovate,* brown, the last whorl smooth when adult. Spire conic but deeply eroded in adults, rarely showing more than 3 whorls distinctly. The last whorl is convex. Aperture bluish-white inside. Outer margin thin, strongly arched, forming half a circle; inner margin slightly arcuate, heavily calloused, white throughout or with a brown edge.

The neanic stage, length 10–11 mm., is conic with an elevated spire sculptured with spiral carinæ, 3 on each whorl of the spire, one ridge being just below the suture, another below the middle, and the third just above the succeeding suture. On the last whorl there are 4 or 5 spiral ridges, the lowest one weak, below the periphery. Subsequently the whorls become more inflated and the spiral sculpture weakens, either disappearing in the penultimate whorl or a single subsutural ridge and sulcus may persist until the beginning of the last whorl.

Length	21,	diam.	13.7	mm.;	aperture	11.5 x 9	mm.
"	20,	"	14	"	"	11.2 x 9.2	"
"	23.5,	"	16	"	"	12.5 x 10	"
"	16.2,	"	12.5	"	"	9.5 x 8	"

Tamasopo River at the "Natural Bridge," near Verastagu, State of San Luis Potosi. Very few found above the bridge, but quite plentiful below.

Adult shells of this species resemble *P. pila* in shape, but they differ by the brown color, bluish-white aperture and white columella. Old shells which have lost most of the spire by erosion are hard to distinguish from *P. pila.* The characters of the young are wholly diverse, and show *P. tristis* to be related to *P. humerosus* and *P. atratus.* Compared with *P. humerosus, P. tristis* differs in lacking a shouldered last whorl, the more ovate shape and the color. It differs from *P. atratus* in shape, sculpture and color.

Pachycheilus moctezumensis n. sp. Pl. XXIV, figs. 11, 12.

The shell is *globose-oval,* solid, purplish-black. The *spire is very short,* the apex slightly projecting; earlier whorls light brown, the apex eroded. Whorls of the spire sculptured with several low spiral ridges. Last whorl oval, smooth, aperture ovate, angular above, broadly rounded below, dark within, black near the lip edge. Inner margin calloused, white, usually with a brown edge.

Length 20½, diam. 14½, aperture 13 x 11 mm., 4 whorls remaining.
" 17½, " 13, " 11½ x 9 " 4 " "

Moctezuma River at the ford south of Tampamolon, State of San Luis Potosi; taken from rocks in shallow water where there was considerable current. They were scarce.

With some resemblance to *P. pila,* this species differs by its more oval shape, the last whorl being less convex and larger, the aperture less wide. *P. pila* has quite a different facies from the great expansion of the last whorl.

In some examples the spire is longer than in those selected as typical: length 23, diam. 15, aperture 14 mm., whorls 6, the spire being perfect.

Pachycheilus pluristriatus (Say). Pl. XXIII, figs. 1–5.

Melania pluristriata Say, New Harmony Dissem., Dec., 1831; Complete Writings, p. 140.
Pachycheilus pluristriatus Say, v. Martens, Biologia Centrali Amer., Moll., p. 449, pl. 26, fig. 1.
Melania rubida Lea, Obs. Gen. Unio, etc., XI, p. 77, pl. 22, fig. 16.
Melania labiosa Wiegmann, in Berlin Mus.

This species is solid, straightly conic, light slate or drab to nearly black in color, glossy, usually with a yellowish band below the suture and sculptured with numerous acute spiral cords narrower and much lighter colored than their intervals, usually 10 to 15 on the last, 6 on the penultimate whorl. The embryonic whorls are smooth, following ones have a keel above the suture, and soon a thread above the keel; additional threads soon appearing. The suture is either rather inconspicuous throughout or moderately impressed at the later whorls. The last whorl is convex. Aperture purple-brown inside, ovate, acutely angular above. Outer lip thin, retracted above. Columella rather narrow. Parietal callus is rather heavy, or sometimes very thick, white, brown at the edge.

Length 37, diam. 17, aperture 15 mm.; whorls 8.
" 33, " 16, " 14 " " 7½.
" 35, " 15, " 13.3 " " 9.

Coy River, San Luis Potosi, on a long water plant in the stream and at the water's edge, quite abundant.

The exact locality of Say's type of this species is not known. It was taken by Mr. Maclure, who went to Mexico by the Tampico route, and therefore may have obtained the shells from the Coy River or its neighborhood. The examples taken by Mr. Hinkley agree fully with Say's. The locality of *M. rubida* Lea was also unknown. Prof.

von Martens figured a specimen from the Berlin Museum, taken by Ferdinand Deppe between 1824 and 1837. These examples were labelled as from Lake Chapala, at the western edge of the Mexican plateau, and draining into the Pacific. It seems unlikely that this snail has any such range, and we are disposed to believe that some mistake about the locality of Deppe's shells has crept in. They agree fully in shape and sculpture with the Coy River examples, but, like *M. rubida* Lea, are dead shells, of a reddish color.

Pachycheilus pluristriatus longus n. subsp. Pl. XXIII, figs. 11, 12.

The shell is longer than *pluristriatus*, black, sometimes fading to flesh color towards the apex, not glossy. The keel above the suture is more prominent and the other spirals are fewer and unequal, part of them being very weak, and they are black like the ground color. The suture is deeply impressed; the base of the last whorl is smooth or weakly sculptured.

Length 37.3, diam. 14.3, aperture 13.5 mm.; whorls 9½.
“ 36, “ 14.5, “ 13.3 “ “ 12.

Ganina River, there miles southwest of San Dieguito, San Luis Potosi.

Pachycheilus pluristriatus tamasopensis n. subsp. Pl. XXIII, figs. 6–10.

The shell is glossy, black, shaped like *P. pluristriatus*. Sculpture weaker, the whole last whorl or its basal half being smooth, without spiral cords, but generally a few spirals persist below the suture.

Length 36½, diam. 17, aperture 14 mm.; whorls 5½.
“ 38, “ 15, “ 15 “ “ 7½.
“ 34, “ 13, “ 14 “ “ 7½.

Small stream north of the mill of the Tamasopo Sugar Co., San Luis Potosi.

Some small examples with the upper whorls eroded show no spirals whatever, and may possibly belong to another species (pl. XXIII, fig. 8). More perfect adult shells or the young stages must be examined. Examples measure:

Length 25, diam. 13, aperture 11.7 mm.; whorls 3.
“ 26.5 “ 15.2, “ 11 “ “ 4½.

Pachycheilus atratus n. sp. Pl. XXIII, figs. 13–18.

The shell is ovate-turrited, solid, covered with a *very smooth*, dense, glossy brownish-black cuticle. The spire is somewhat acuminate; early whorls smooth; intermediate whorls often showing a few weak spiral cords below the suture and a weak angle at the shoulder. Last whorl flattened below the very deep suture, elsewhere very convex and smooth, though on some examples faint traces of very minute spiral lines may be discerned. The aperture is rounded-oval or rounded-ovate, somewhat livid and translucent within but generally with a black band bordering the lip. It projects beyond the general outline of the cone. Outer and basal margins of the peristome are thin, black, and well rounded; inner margin straightened more or less, white within, with a black or brown-black edge; 5 or 6 whorls remain in adult shells, only the tips being eroded.

Length 30, diam. 16 mm.; aperture 13 x 9 mm.
" 27, " 15½ " " 13 x 11 "
" 27, " 14 " " 12⅓ x 10 "

Tamosopo River near Verastagu, San Luis Potosi, above and below the "Natural Bridge" (pl. XXIII, figs. 13 to 15).

While clearly related to *P. humerosus*, this species is easily distinguished by its rounded whorls. A large quantity of each was taken. The type lot consists of beautifully perfect, clean shells from above the bridge. Those found below the bridge are not so clean.

Specimens from a rill issuing from a cave on the mountain side above Los Canoas are incrusted with a gray calcareous deposit so that adults resemble pebbles, but when cleaned the shell within is found to be almost or entirely perfect (pl. XXIII, figs. 16, 17, 18). Fig. 18 represents a cleaned specimen. They are smaller than the type lot, about 24 mm. long.

A lot taken in the rill on the mountain above the "Natural Bridge" consists of dwarf shells, adults measuring 19 to 21 mm. long. *P. pila* in the same stream is even more dwarfed.

Pachycheilus atratus ganinus n. subsp. Pl. XXIII, figs. 19, 20.

A race of *P. atratus* occurs in the Ganina River three miles southwest of San Dieguito. The black shell is dull with the middle and lower whorls of the spire ridged or coarsely striate spirally, usually with 5 to 8 striæ on the penultimate whorl. Several of these spiral cords usually continue on the last whorl below the suture. The upper whorls of the spire are smooth and convex. The aperture is shaped as in *P. atratus*. Fig. 19 represents a cleaned shell, fig. 20 one incrusted.

Length 24, diam. 13, aperture 11½ mm.

There are some abnormally shortened shells, length 17, diam. 12, aperture 10½ mm. The spire is generally covered with a hard calcareous crust, difficult to remove. *P. pluristriatus longus* occurs in the same place.

This form resembles *P. a. suprastriatus* closely, but differs by having smooth post-embryonic whorls. It is also constantly black in color.

Pachycheilus atratus suprastriatus n. subsp.

The shell resembles *P. atratus* in shape and aperture. It is less glossy, brownish black, dark brown or corneous-brown, the whorls of the spire spirally striate, the striæ sometimes persisting on the last whorl below the suture. The earliest post-embryonic whorls are acutely carinate, the carina continuing downward above the suture as additional acute cords arise above it. On the third from the last whorl, in a cotype, there are 5 equal acute striæ.

Length 30½, diam. 15, aperture 13 mm.; 6 whorls remaining.
" 24, " 13, " 11½ " 5 " "
" 24½ mm.; 7½ whorls remaining.
" 34, diam. 16 mm.; aperture 13 x 10 mm.
" 24, " 13 " " 10 x 7 "

Valles River at Mecos falls, and some rapids two miles west of Mecos, State of San Luis Potosi, Mexico.

The only species of *Pachycheilus* found in the vicinity of Mecos. The young differ from those of *atratus* and *ganinus* in being carinate; the early whorls of the spire enlarge more regularly, and the color is a dull horn or light shade of brown without the polish of the young *atratus*.

Taken from the bed of the river in a moderate current, and sheltered pools where there was no current.

Mecos falls are a number of small falls and rapids where the Valles River comes from the mountains to the valley. Standing on the railroad track and looking east and a little to the right, Valles can be seen as a spot in the valley, and still farther in the next range of mountains is seen the rock face of the cut through which the railroad passes and in which lies the village of El Abra.

Pachycheilus humerosus n. sp. Pl. XXIII, figs. 21–25.

The shell is ovate-turrited, solid, black with pale spiral bands on the ridges, the cuticle smooth and dense. Spire acuminate when not eroded, the earliest whorls (in young shells) clear brownish, first 5 whorls smooth and not very convex, then two spiral ridges appear, rapidly becoming stronger, a third ridge appearing below the suture about the 8th whorl, and sometimes others between the primary ridges. A specimen 9 mm. long with 8 whorls has 7 spiral ridges on the last whorl, each showing as a white band within the aperture. One 15 mm. long with 9 whorls has 7 such ridges and bands on the last whorl. The whorls then enlarge very rapidly, the suture deepens. On the penultimate whorl of an adult there are about 5 spiral pale ridges, the lower ones wider and lower. On the last whorl the ridges weaken, leaving it smooth or nearly so, or they may persist below the suture and at the base; *the suture becomes very deep,* the whorl below it *horizontal, shouldered,* the shoulder bounded by a ridge or angle. The aperture is rounded-ovate, blackish within but pale or banded in the throat; outer and basal margins thin, black, broadly rounded; inner margin more or less straightened, appressed or free and continuous, brown at the edge, the callus white. 3½ to 6 whorls usually may be counted in adult shells.

Length 28, diam. 18, aperture 13½ x 10 mm.
" 27, " 17, " 14 x 12 "
" 25, " 18½, " 14⅓ x 12 "
" 25, " 16½, " 14 x 10⅓ "

The operculum is ovate, with the nucleus about one-third across from the columellar side and below the middle.

Tamosopo River, near Verastagu, above and below the "Natural Bridge."

The light colored cords alternating with purple-black bands makes it a conspicuous shell when seen in the water. While the general shape is that of *P. atratus,* this species differs from that by its conspicuous sculpture. It is more allied to *P. tristis,* though very distinct.

Pachycheilus monachus n. sp. Pl. XXIV, figs. 21–25.

The shell is solid, cylindric with conic spire, or turrite-conic, black. The earliest whorls appear to be smooth; then sharp spiral cords much narrower than their intervals appear, evenly spaced, and five on each whorl; these disappear on the last two whorls, or one to three persist only below the suture, where the whorl is more or less tumid or shouldered. The spire is rather long and conic; suture deep; last whorl convex or flattened laterally. The aperture is ovate, whitish inside, black near the lip. Outer lip sharp and strongly arcuate. Columellar lip more straightened, heavily white-calloused, usually brownish at the edge.

Length 32, diam. 14.3, aperture 13 mm.; whorls remaining 8.
" 28, " 13.3, " 12 " " " 4½.
" 25½, " 14, " 12 " " " 4½.

Coy River, three miles south of Los Palmas, State of San Luis Potosi, Mexico.

The Coy River issues from a cave at the foot of the mountain below the railroad track. Specimens taken near the cave and a short distance within average smaller than those taken lower down the stream, but agree with them in other characters. They measure 20 to 28 mm. long.

P. monachus has some resemblance to *P. a. suprastriatus,* but in that the spiral striæ are coarser and less regular, the aperture is less angular above, and projects more laterally beyond the outline of the cone, as in *P. atratus.*

Pachycheilus vallesensis Hinkley.

Nautilus, XXI, p. 25, pl. 5, figs. 1–3, 5–7, 10 (July, 1907).

This species was taken in the Valles River at Valles; most abundant where there is but little current. Also at the ranch of C. P. Willis. In all kinds of situations. In some places the young were very numerous. The largest ones were on rocks and in the bed of the river where there was little or no current. The large typical form also occurred in the Panuco River at Pujal, on a rock outcrop in the bed of the river. This is a wide shallow stream in which there is a large amount of shifting sand. Few shells were found where the stream was visited.

Very large shells, some 37½ x 18½ mm., were taken in the Moctezuma River at the ford, in the bed of the stream.

P. vallesensis differs from the other stout species of the region by its bluish, ashy or blackish-gray color, reminding one of *Goniobasis livescens,* and by the white columellar callus.

Pachycheilus vallesensis attenuatus n. subsp.

The shell is livid bluish when clean, smaller and much more slender than *vallesensis,* with a comparatively longer spire. Whorls 8 or 9, the upper ones weakly striate spirally, last whorl smooth. Aperture ovate, acutely angular above. Parietal callus thick and white, the appressed edge often yellowish or brownish.

Length 26, diam. 11, aperture 9 mm.
" 28, " 13½, " 12½ "

Chaimai Creek (about halfway between Valles and Pujal) and Casas Viejas River, a tributary of the Valles River, coming from the north of Valles, and emptying into the Valles River some miles east of Mecos falls.

These shells were at first thought to be *P. suprastriatus,* but they differ in the striæ of the young being finer and more numerous; there is also a difference in the aperture and columellar callus, and the outer lip is never extended beyond the line of the spire as in *suprastriatus.*

In 1907 this form was included in the description of *P. vallesensis* and figured (see *Nautilus*, Vol. 21, figs. 4, 8 and 9 of pl. 5). They are more acute in the spire and thinner than typical *vallesensis*, also smaller. The shells taken the past winter were from farther up the stream than those taken two years before. Not one could be found at the place where they were then.

Chaimai Creek is about two miles down the Valles River from the Willis ranch (where typical *P. vallesensis* occurs), and begins with a spring about a mile from the river. The water of the spring is a little warm and the pool there contains no *Pachycheilus*. Lower down they were often on and among decaying leaves.

Pachycheilus suturalis n. sp. Pl. XXIV, figs. 16–20.

The shell is turrited, regularly and slowly tapering, moderately solid though rather thin, black, blackish-brown or brown. In perfect shells the first (embryonic) 2⅓ whorls are smooth and convex; four or five following whorls have an acute carina below the middle, with an acute thread above and one below it; on subsequent whorls the carina is reduced and the number of spiral threads increases, so that there is a brief stage of about one whorl where the convex surface has about 6 subequal spirals; the lower spirals then diminish, leaving the last 3 or 4 whorls nearly smooth except for *a group of usually three or four spiral cords just below the suture.* Some weak traces of spiral striæ may often be seen on the smoothish portion, under the lens. The aperture is broadly ovate, narrower above, but rounded there in adults, broadly rounded below. The peristome is thin, blackish, noticeably retracted just below the columella, and the outer lip is sinuous, being somewhat retracted above. The parietal callus is brown or blackish, rather heavy.

Length	28,	diam.	13,	aperture	11	mm.;	whorls	remaining	5½.
"	28,	"	11½,	"	11	"	"	"	6½.
"	24½,	"	11,	"	10	"	"	"	6½.
"	26,	"	11⅓,	"	9⅓	"	"	"	7.

Creek near Tampamolon, with *P. pleurotoma.* Also found in the creek at Coxcantlan, a creek one mile above the ford of the Moctezuma River, and in the first and second brooks crossed on the road through the mountains to the Moctezuma River; all in the State of San Luis Potosi.

This species is related to *P. pleurotoma,* which differs chiefly by its Pleurotomoid sinus. The only other related species is *P. saussurei* (Brot),[3] of which two of the original lot, received from Dr. Brot, are in the collection of the Academy of Natural Sciences of Philadelphia. In *P. saussurei* several whorls following the embryonic shell are *convex and smooth,* not keeled as in *P. suturalis;* and lower down the whorls have in addition to the subsutural group of striæ a weak longitudinal plication, which is wanting in *P. suturalis.*

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[3] See Küster's Conchylien Cabinet, *Melanaceen*, p. 43, pl. 5, fig. 7; type locality a swamp in the woods bordering the Rio Grande, which empties into the Laguna de Meztitlan, State of Hidalgo. It has no outlet to the sea.

The largest examples are from a creek about a mile above the ford of the Moctezuma River. Two measure:

Length 34, diam. 15, aperture 13 mm.; whorls remaining 4.
" 33.2, " 12.2, " 12 " " " 7½.

Those from the creek at Coxcantlan are not quite so large as the type lot, and the shells from the two rills in the mountains are small; those from the first rill have the lip slightly expanded, and are quite slender, measuring:

Length 18.2, diam. 7, aperture 6.2 mm.; whorls 8½.
" 20, " 7.3, " 7 " " 10 (apex perfect).

They live in the same stream with *P. pleurotoma,* but were not noticed feeding with that species, seeming to prefer the rocks where there is considerable current.

Those from the second rill are slightly larger and less slender, about 21 x 10 mm.

Pachycheilus pleurotoma n. sp. Pl. XXIV, figs. 13-15.

The shell is slender, turrited or spire-shaped, rather thin, hair-brown or greenish-olive. Spire long, slightly attenuate above. The earliest whorls are smooth and rounded; then some spiral threads appear, one near the lower suture rapidly increasing to a projecting carina, with one thread below, one to three above it; this stage continuing 3 or 4 whorls. The carina then disappears, leaving the whorls rounded with about 5 threads, and sometimes a low, indistinct longitudinal plication. The spiral threads then disappear, leaving the *last* 2 *to* 4 *whorls convex and smooth except for* 3 *or* 4 *spiral cords just below the suture.* The last whorl usually becomes a little shouldered near the aperture. The aperture is small, very broadly ovate, being somewhat narrower but rounded above. The outer lip, close below the suture, is retracted to form *a deep rounded sinus,* much as in the marine genus *Drillia.* Elsewhere the lip is thin and simple. The basal lip is broadly rounded. Columellar margin straightened or much less arched than the outer margin, moderately thickened.

Length 36⅓, diam. 12⅓, length of aperture 11½ mm.; whorls 10.
" 29, " 10½, " " " 9⅔ " " 10.

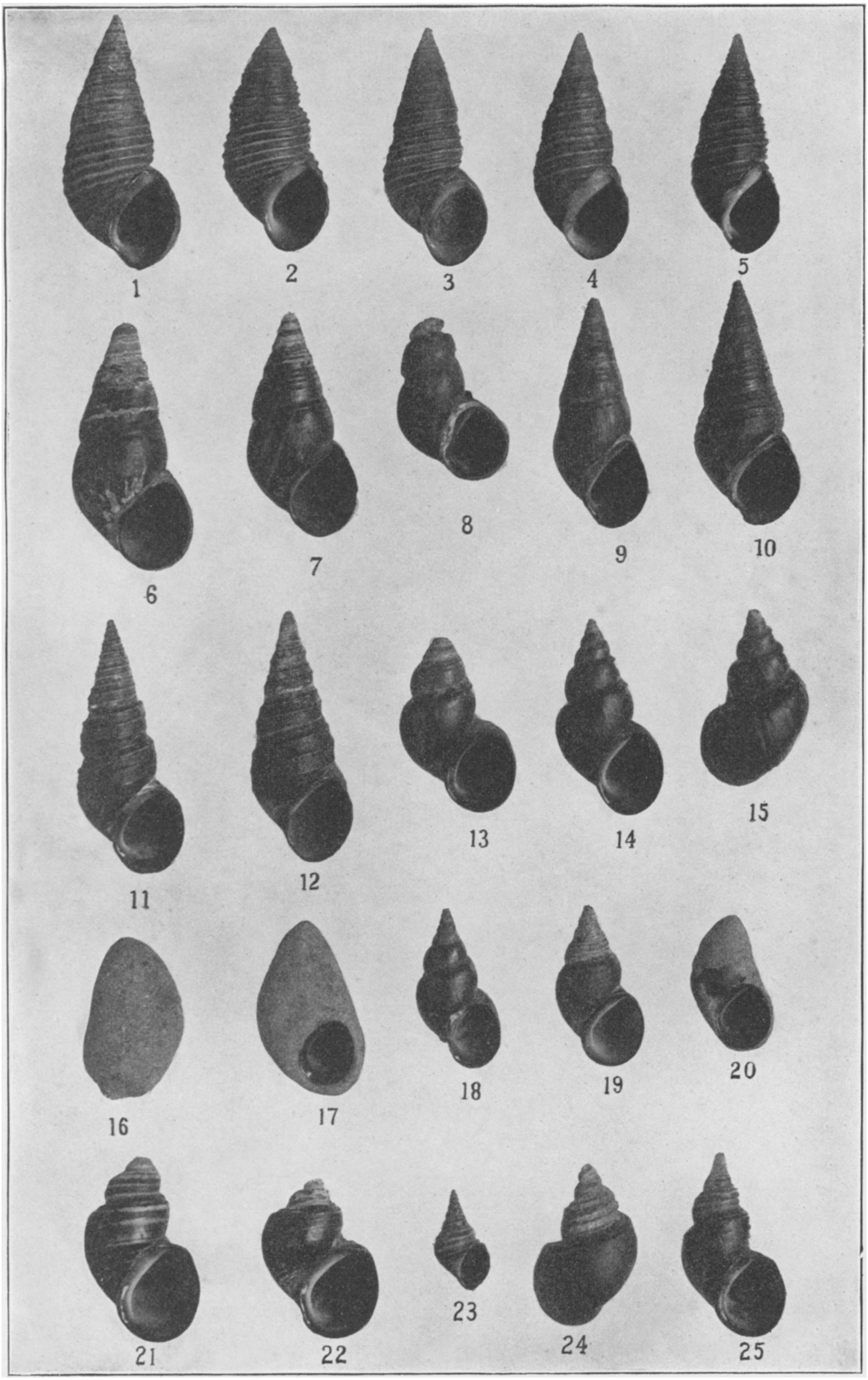
Mountain rill on the road going north from Tampamolon, and several small streams not far from Coxcantlan. Types from the first rill on the road to the Moctezuma River. The shells were found where there was little or no current and seemed to be feeding on decaying vegetation, chiefly on fruit of the wild orange.

This species is distinguished from others of its group by the deep Pleurotomoid notch. In *Pachycheilus* this structure is known only in *P. dalli* Pils., a species very different in other characters. Perfect shells may have as many as 12 whorls, but the tip is generally lost in adults.

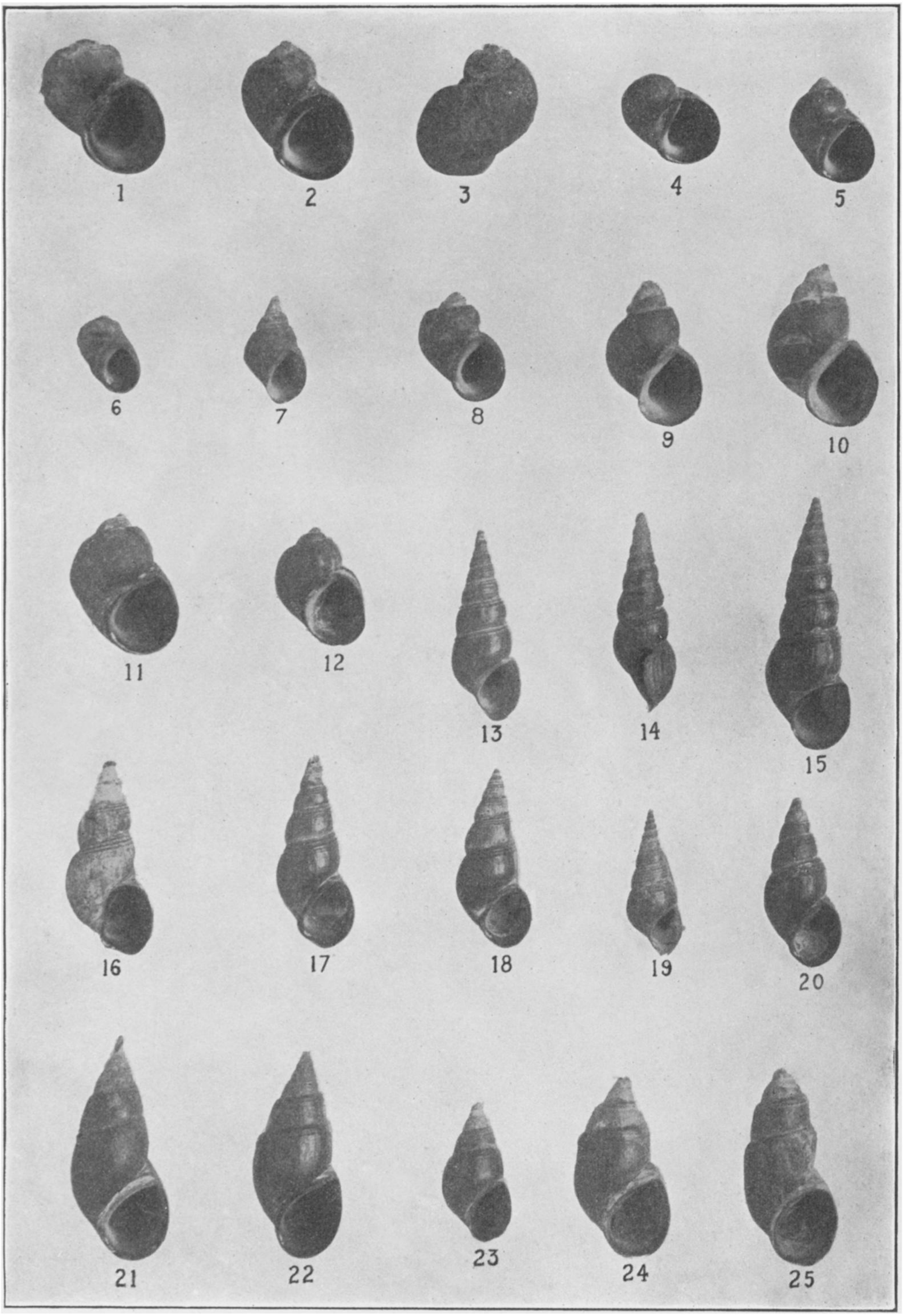
EXPLANATION OF PLATES XXIII, XXIV.

PLATE XXIII.—Figs. 1–5—*Pachycheilus pila* n. sp. Cotypes.
Fig. 6—*P. pila pilula* n. subsp. Cotype.
Figs. 7–10—*Pachycheilus tristis* n. sp. Cotypes.
Figs. 11, 12—*Pachycheilus moctezumensis* n. sp. Cotypes.
Figs. 13–15—*Pachycheilus pleurotoma* n. sp. Cotypes.
Figs. 16–20—*Pachycheilus suturalis* n. sp. Cotypes.
Figs. 21–25—*Pachycheilus monachus* n. sp. Cotypes.

PLATE XXIV.—Figs. 1–5—*Pachycheilus pluristriatus* (Say). Coy River.
Figs. 6–10—*Pachycheilus pluristriatus tomasopensis* n. subsp. Cotypes.
Figs. 11, 12—*Pachycheilus pluristriatus longus* n. subsp. Cotypes.
Figs. 13–15—*Pachycheilus atratus* n. sp. Cotypes.
Figs. 16, 17, 18—*Pachycheilus atratus* n. sp. Los Canoas.
Figs. 19, 20—*Pachycheilus atratus ganinus* n. subsp. Cotypes.
Figs. 21–25—*Pachycheilus humerosus* n. sp. Cotypes.



PILSBRY AND HINKLEY: MELANIIDÆ OF THE PANUCO RIVER.



PILSBRY AND HINKLEY: MELANIIDÆ OF THE PANUCO RIVER.